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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,127	12/03/2001	Naoko Yamamoto	70551/56755	5908

21874 7590 07/18/2003

EDWARDS & ANGELL, LLP
P.O. BOX 9169
BOSTON, MA 02209

EXAMINER

HASSANZADEH, PARVIZ

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 07/18/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,127

Applicant(s)

YAMAMOTO ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 14 and 30. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Mabuchi et al (US Patent No. 5,645,644).

Mabuchi et al teach a plasma processing apparatus (Fig. 10A) comprising:

a reaction chamber 1 (*a process chamber for processing by means of plasma*);

a waveguide 23 and a dielectric sheet 21 (*microwave transmission means for transmitting microwave to said process chamber*);

a microwave window 4 (*a dielectric for radiating the microwave transmitted by said microwave transmission means into said process chamber*); and

a window support member 5 having openings 6 formed in the shape of slit with the intention of improving the uniformity of plasma (*a slot antenna plate formed of conductor, placed on a side, facing said process chamber, of said dielectric, and including an opening for passing the microwave therethrough radiated from said dielectric*) (column 5, lines 28-64 and column 8, lines 33-51).

Claims 1, 3, 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Katayama et al (US Patent No. 5,545,258).

Katayama et al teach a plasma processing apparatus (Fig. 3) comprising:
a reaction chamber 21 (*a process chamber for processing by means of plasma*);
a waveguide 6 and a dielectric sheet 4 (*microwave transmission means for transmitting microwave to said process chamber*);
a microwave introducing window 5 (*a dielectric for radiating the microwave transmitted by said microwave transmission means into said process chamber*); and
a metal plate 11 having slit-like microwave transmission holes 12 as shown in Figs. 4A, 4B(*a slot antenna plate formed of conductor, placed on a side, facing said process chamber, of said dielectric, and including an opening for passing the microwave therethrough radiated from said dielectric*) (column 6, line 38 through column 8, line 8).

Further regarding claims 3: the metal plate 11 serve as anode which is confronted with a cathode (sample holder 2a), the metal plate 11 is connected to ground via the reactor 1 (column 7, lines 1-13 and lines 59-63).

Further regarding claims 4: the metal plate 11 further includes a large number of small holes 13 through which process gases are introduced into the chamber (column 7, lines 40-58).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi et al (US Patent No. 5,645,644).

Mabuchi et al in Fig. 10A teach all limitations of the claims as discussed above except for the window support member 5 (slot antenna plate) including a channel for process gas.

Mabuchi et al further in Fig. 7A teach that the window support member 5 may include gas inlets 41 provided in the beams 5b for improving the uniformity of plasma (column 7, lines 41-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the gas inlets as taught in Fig. 7A in the apparatus of Fig. 10A in order to improve the uniformity of plasma.

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Further regarding claim 2: arrangement of the openings of the window support member (slot antenna plate) with respect to the location of the antinode of a standing wave is considered to have been obvious to one of ordinary skill in the art at the time of invention as Mabuchi et al further teach that the electric field in each slit opening 6 is intensified (column 8, lines 42-51).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama et al (US Patent No. 5,545,258).

Katayama et al teach all limitations of the claims as discussed above except for explicit disclosure of the arrangement of the openings 12 of the metal plate 11 (slot antenna plate) with respect to the location of the antinode of a standing wave.

Arrangement of the openings 12 in the metal plate 11 with the antinode of standing wave is considered to have been obvious to one of ordinary skill in the art at the time of invention via routine optimization in order to allow transmission of microwave through the openings more efficiently.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Akimoto (US Patent No. 5,614,025) teach a microwave plasma reactor (Fig.2) including an upper electrode 42 placed on the surface of a microwave transmission dielectric plate 40, wherein the conductive member is also coupled to a DC power source 52.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.


Parviz Hassanzadeh
Primary Examiner
Art Unit 1763

July 8, 2003